Statement of
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Good Morning, Mr. Chairman and Members of the Committee.

Thank you for inviting me here today to discuss our work in the field of health information technology.

In April of last year, Dr. Jonathan B. Perlin, MD, PhD, MSHA, FACP, Under Secretary for Health, Department of Veterans Affairs, appeared before the House Committee on Veterans' Affairs, Subcommittee on Oversight and Investigations to discuss the importance of electronic health records and the role of the Department of Veterans Affairs (VA) in the development, use, and sharing of this valuable technology. President Bush had just outlined an ambitious plan to ensure that most Americans have electronic health records within 10 years. The President noted a range of benefits possible with the expanded use of information technology, including reduced costs**;** improved health care quality; reduced frequency of medical errors; advancements in the delivery of appropriate, evidence-based medical care; greater coordination of care among different providers; and increased privacy and security protections for personal health information.

A lot has happened in the field of health information technology in the year since the President's call to action announced at the VA Maryland Health Care System in April 2004, and discussions about the potential of electronic health records have become part of the national conversation. I have included, for the record, a brochure that highlights President Bush's April visit to the Baltimore VA Medical Center.

One of the most important vehicles for achieving the President's vision for health IT is the American Health Information Community (AHIC), convened by the Department of Health and Human Services (HHS). AHIC will provide a valuable forum for us to work with our public- and private-sector partners on issues affecting veterans' health. VHA Under Secretary for Health Dr. Jonathan B. Perlin, will serve as one of 17 AHIC commissioners. AHIC will actively engage with the health community to provide input and recommendations to HHS on how to make health records digital and interoperable,

and ensure that the privacy and security of those records are protected, in a smooth, market-led way.

Today I'd like to talk about VA's leadership in the field of health information technology, and tell you about our next generation health information system, known as Health**e**Vet. I'd also like to highlight our work in three areas that I think are pivotal to the broader, successful adoption of electronic health records: data standardization, interoperability, and privacy.

A History of Innovation

With one of the most comprehensive electronic health record (EHR) systems in use today, VA is a recognized leader in the development and use of EHRs and other information technology tools. VA's work in health information technology goes back almost 30 years, when VA created the Decentralized Hospital Computer Program (DHCP), one of the first automated health information systems ever developed to support multiple sites and cover the full range of health care settings. VA has continued to lead the health care community in the development of new health IT tools, building on the foundation of DHCP to create the VistA system in use today – a suite of over 100 applications which support the day-to-day clinical, financial, and administrative functions of the Veterans Health Administration (VHA). These applications form the foundation of VistA – the Veterans Health Information Systems and Technology Architecture, the automated health information system used throughout VHA.

Many VistA enhancements were designed to support the transformation of the VA health system over the past decade, as VA shifted its emphasis from inpatient care to outpatient care, and introduced performance measures and performance-based accountability throughout its health care system. In the mid-1990's, VHA embarked on an ambitious effort to improve the coordination of care by providing integrated access to these applications through implementation of an electronic health record, known as the Computerized Patient Record System or CPRS.

With CPRS, providers can access patient information at the point of care – across multiple sites and clinical disciplines. CPRS provides a single easy to use graphical user interface through which providers can update a patient's medical history, place a variety of orders, and review test results and drug prescriptions. The system has been implemented at all VA medical centers and at VA outpatient clinics, long-term care facilities, and domiciliaries – 1,300 sites of care throughout VHA.

The Benefits of Electronic Health Records

Electronic health records, or EHRs, are appealing for a number of reasons, including convenience, availability, and portability. *The most compelling reason to use information technology in health care is that it helps us provide better, safer, more consistent care to all patients.* The President referred to an oft-cited 1999 report in which the Institute of Medicine (IOM) estimated that between 44,000 and 98,000

Americans die each year due to medical errors. IOM's 1999 report further found that many more die or suffer permanent disabilities because of inappropriate or missed treatments in ambulatory care settings. IOM cited the development of an electronic health record as essential for reducing these numbers and improving the safety of health care. In its 2002 publication *Leadership by Example*, IOM noted that "[c]omputerized order entry and electronic medical records have been found to result in measurably improved health care and better outcomes for patients."

How do EHRs improve patient safety and quality of care? First, with an EHR, all relevant information is available to clinicians when they need it, where they need it – and it's legible. A provider can quickly review information from previous visits, have ready access to clinical guidelines, and survey research results to find the latest treatments and medications. All of this information is available wherever patients are seen – in acute settings, clinics, examining rooms, nursing stations, and offices.

Many of us see different doctors for different medical conditions. How many of these physicians have access to all of the information that has been collected over the course of these visits? In VHA, patient records from multiple sites and different providers can be viewed at the same time at the point of care. This is simply not possible with paper records.

In addition to making medical records more accessible, EHRs help clinicians better document the reasons a patient sought care and the treatment that was provided. Given the time constraints they face, many physicians resort to writing brief, sometimes cryptic notes in a patient's chart, and then write more complete documentation when they have time. EHRs enable clinicians to document care quickly and thoroughly, and can provide reminders based on the specific medical conditions and test results that have been documented.

CPRS, for example, allows clinicians to enter progress notes, diagnoses, and treatments for each encounter, as well as discharge summaries for hospitalizations. Clinicians can easily order lab tests, medications, diets, radiology tests, and procedures electronically; record a patient's allergies or adverse reactions to medications; or request and track consults with other providers.

Even if we could transfer paper records quickly and reliably from one provider to another, and make sure that the information in records was complete, many hard-copy patient records simply contain too much information for a clinician to sift through effectively. There is always the possibility that something crucial could be missed. When health information is stored electronically, however, we can make use of software tools to analyze that information in real-time. We can target relevant information quickly, compare results, and use built-in order checks and reminders to support clinical decision-making. These capabilities promote safer, more complete, more systematic care.

Consider the benefits we have seen in VHA in the area of medication ordering. When orders for medications are handwritten or given verbally, opportunities for errors are unacceptably high and occasional serious errors are inevitable. However, when physicians use computerized order-entry systems to enter medication orders electronically, errors caused by illegible handwriting or misinterpretation of dosages, strengths, or medication names are virtually eliminated. CPRS includes automated checks for drug-drug or drug-allergy interactions, alerting the prescribing physician when potentially dangerous combinations occur. Currently, 94% of all VHA medication orders are entered by the ordering provider directly into VistA using CPRS.

Information technology can also serve to reduce the number of errors that occur when medications are given to a patient. VHA's Bar Code Medication Administration system (BCMA) is designed to ensure that each patient receives the correct medication, in the correct dose, at the correct time. In addition, the system reduces reliance on human short-term memory by providing real-time access to medication order information at the patient's bedside.

BCMA provides visual alerts – prior to administration of a medication – if the correct conditions are not met. For example, alerts signal the nurse when the software detects a wrong patient, wrong time, wrong medication, wrong dose, or no active medication order. These alerts require the nurse to review and correct the reason for the alert before actually administering the drug to the patient. Changes in medication orders are communicated instantaneously to the nurse administering medications, eliminating the dependence on verbal or handwritten communication to convey these order changes. Time delays are avoided, and administration accuracy is improved.

BCMA also provides a system of reports to remind clinical staff when medications need to be administered or have been overlooked, or when the effectiveness of administered doses should be assessed. The system also alerts staff to potential allergies, adverse reactions, and special instructions concerning a medication order, and order changes that require action.

The VistA Imaging system is another application which has extended the capabilities of VistA and CPRS. VistA Imaging stores medical images such as x-rays, pathology slides, scanned documents, cardiology exam results, wound photos, and endoscopies directly into the patient record as soon as they become available, providing clinicians with additional information essential for diagnosis and treatment.

I have used VA's electronic health record system for years. As a doctor – and as a patient – I am very enthusiastic about the benefits of this technology.

The Importance of Standards

The richness of VA's EHR is evident, in terms of both clinical features and health data. Imagine the benefits of sharing this data – appropriately and securely – among VA's health delivery partners, so that relevant health information would be available

regardless of where a veteran sought care. As we move towards this goal, we need to make sure that we share not only *data*, but *meaning*. And to do this, we need health data standards.

Virtually all clinical documents created by VA providers are stored in the EHR, and data from commercial medical devices can be transmitted automatically directly into a patient's health record. To give you a sense of the magnitude of EHR use in VA, let me give you some round numbers: As of June 2005, VA's VistA systems contained 698 million progress notes, discharge summaries, and other clinical documents; 1.4 billion orders, and 338 million images. More than 567 thousand new clinical documents, 930 thousand orders, and 533 thousand images are added *each workday* – a wealth of information. As VA moves to a patient-centered health data repository, over 850 million vital sign recordings from sites throughout VA will also be available.
And yet, with an electronic health record – as with a paper record – more information isn't always better if we can't use it. How can we be sure we can take full advantage of the voluminous information we collect in the EHR? The key is data standardization.

There's an old joke in the standards field: "The great thing about standards is that there are so many to choose from." For nearly every kind of clinical data – from diseases, procedures, and immunizations, to drugs, lab results, and digital images – there are multiple sets of standards to choose from. For example, there are at least 12 separate systems for naming medications, and the ingredients, dosages, and routes of administration associated with them.

It is often necessary to use a combination of data standards to transmit a single message from one system to another. Even health care organizations committed to using standards have a difficult time figuring out which standards to use.

Consolidated Health Informatics (CHI) is an eGov initiative involving Federal agencies with responsibility for health-related activities and information. CHI participants evaluate and choose health data and communication standards to be incorporated into their IT systems maintaining, processing, or transmitting this information. VA was instrumental in the formation of CHI, and works closely with the Department of Defense (DoD) and the Department of Health and Human Services (HHS), and other CHI partners**,** to help foster the federal adoption of the agreed-upon standards as part of a joint strategy for developing federal interoperability and sharing of electronic health information. To date, CHI has selected 20 communications and data standards in areas such as laboratory, radiology, pharmacy, encounters, diagnoses, nursing information, and drug information standards developed through collaboration between VA and HHS. We also work with external Standards Development Organizations (SDOs) to augment and refine available standards to ensure that they meet health care delivery needs in the VA.

Within VA, we have established a formal program across all sites of care, to coordinate the adoption, implementation, and verification of health data standards selected through the CHI process, and standards agreed upon through the AHIC process as they become available. The work involved in adopting and implementing data standards is

deliberative and difficult. It requires collaboration among clinicians, health information professionals, developers, and business process experts. Yet, the use of data standards can have a very real effect on a patient's care.

When VA developed its first EHR, the technological environment in VA hospitals – as in other hospitals at the time – was very different from the environment today. There was not a computer on every desk. There were no graphical user interfaces, only text-based displays on "dumb terminals." There were no multi-color screens, no Windows, no pull-down menus. No one had a mouse. When you wanted to enter data in an electronic health record, you didn't point-and-click to choose from a menu of options, you typed.

For example, when a clinician wanted to document a patient's allergy to penicillin, he typed the word "penicillin" in the allergy section of the patient's electronic health record. To save time, many clinicians entered "PCN", a common abbreviation for penicillin.

As part of our data standardization effort, we went back and looked at the allergy data that had been collected over the years. We found that "penicillin" and "PCN" had been typed in more than 75,000 times. We also found thousands of entries in which penicillin had been misspelled. Not only is it a waste of time to type the same information over and over, it introduces a potential patient-safety issue. Let me give you an example.

Suppose a veteran comes in for a check-up and tells the physician that he is allergic to sulfa drugs. The physician enters this information in the patient's record under allergies, but because he is typing quickly, he inadvertently misspells the word 'sulfa'. Suppose that on a subsequent visit, another clinician orders Sulfamethoprim, which is a type of sulfa drug. When a clinician orders a medication, CPRS checks the patient's record to see if the patient is allergic to the medication. Although the system checks for common misspellings, it can't predict every possible misspelling of every medication. In this case, CPRS might not alert the second physician that he had ordered a drug the patient was allergic to, simply because the word "sulfa" was misspelled when it was entered by the first physician. By eliminating misspellings and establishing a standard vocabulary across sites, we will ensure that medication order checks work as intended, and that the EHR supports patient safety and clinical decision-making to the fullest extent.

Data Standards and Interoperability

The use of electronic health records and other information technology tools in a single medical office can improve health care quality, reduce medical errors, improve efficiency, and reduce costs for the patients treated there. However, as the President noted a year ago, the full benefits of IT will be realized when we have a coordinated, national infrastructure to accelerate the broader adoption of health information technology.

The problems created by a lack of standardized data are magnified when interacting with other organizations. Even seemingly straightforward information can be misconstrued when it is interpreted by different organizations.

Consider two simple terms: yes and no. In many computer systems, the number '1' is used to indicate 'yes', and the number '2' is used to indicate 'no'. In some systems, it is reversed: '1' means 'no', and '2' means 'yes'. Some systems use '0' and '1', instead of '1' and '2'. In still other systems, 'Y' is used to indicate 'yes', and 'N' is used to indicate 'no'. Sometimes lower-case 'y' and 'n' are used. Sometimes, 'yes' is actually stored as 'y-e-s', and 'no as 'n-o'. In VA, we found 30 different combinations of codes for 'yes' and 'no', stored in nearly 4,000 different data fields. We can standardize our representation of 'yes' and 'no' within VA computer systems, but unless our healthcare partners employ the same standards to exchange data with us, we cannot be sure that we are conveying the intended meaning of the data we are exchanging. If standardizing on a simple "yes or no" is this complicated, just imagine the complexity of implementing standards across all areas of health information.

The Office of the National Coordinator for Health Information Technology (ONCHIT) recognizes the importance of data and communications standards in developing a comprehensive network of interoperable health information systems across the public and private sectors. Without data standards, we might be able to exchange health information, as we do now when we copy and send paper records, but we won't be able to use it as effectively to deliver safer, higher-quality care using clinical alerts and reminders. True interoperability between providers simply cannot be achieved without data standardization.

VHA has a long history of participation in standards development organizations. As a health care provider and early adopter of health IT on a large scale, VHA frequently identifies areas for standards development and works with other public- and private-sector organizations to develop consensus-based solutions. HHS Secretary Mike Leavitt recently announced the formation of the American Health Information Community. ONCHIT has released a Request for Proposal to develop, create prototypes for, and evaluate a process for standards harmonization. This effort will foster a more cohesive, integrated approach to standards development, replacing the existing fragmented, inefficient approach in which standards are developed topic-by-topic. VHA supports ONCHIT efforts and continues to participate in HHS-led activities with other Federal partners.

Our data standardization efforts at VA have already improved our ability to share information with other agencies. I'd like to highlight our work with the Department of Defense.

In April 2002, VA and DoD adopted a joint strategy to develop interoperable electronic health records by 2005. This cross-cutting initiative, known as the VA/DoD Joint Electronic Health Records Interoperability (JEHRI) Plan - Health**e**People (Federal), is based on the common adoption of standards, the development of interoperable data repositories, and joint or collaborative development of software applications to build a replicable model of data exchange technologies. The progress made by VA and DoD has served as a catalyst to move the health care industry toward the use of interoperable health information technologies that have the potential to improve health

care delivery, increase patient safety, and support the provision of care in times of crisis.

Through collaborative efforts, VA and DoD will be better positioned to evaluate health problems among service members, veterans, and shared beneficiary patients; to address short- and long-term post-deployment health questions; and to document any changes in health status that may be relevant for determining disability.

VistA-Office EHR

As a physician, I have seen first-hand the benefits of electronic health records in VA: immediate access to information, elimination of duplicate orders, increased patient safety, improved information-sharing, more advanced tracking and reporting tools, and reduced costs. VHA is now working with the Centers for Medicare and Medicaid Services (CMS) to make the benefits of electronic health records available to private physician offices and clinics. CMS is contracting to adapt the VistA-Office EHR (VOE), an enhanced version of VA's VistA and CPRS designed specifically for use in non-VA clinics and physician offices. On September 19th, CMS released an evaluation version of VOE, and will be closely monitoring the impacts of this release.

*The Health**e**Vet Program*

The spirit of innovation that inspired the development of VistA, CPRS, BCMA, and VistA Imaging has led VA to the next step in the evolution of health care IT – Health**e**Vet. Health**e**Vet-VistA is VA's next-generation health information system, designed to support more personalized care for our veterans, more sophisticated clinical tools for our doctors and nurses, and more advanced communication with our health care partners. Health**e**Vet builds on decades of VA expertise in health care IT to support the strategic goals of the department, meet interagency obligations, take advantage of new developments in technology to address weaknesses in the current system, and most importantly, improve the safety and quality of health care for veterans.

VA has been recognized by IOM and the mainstream press as having one of the most sophisticated EHR systems in the world. VistA and CPRS are in the public domain and have served as models for healthcare organizations in the public and the private sectors alike. VistA has been adopted for use by the District of Columbia Department of Health, and state veterans homes in Oklahoma. A number of other countries have either implemented VistA or expressed an interest in acquiring the technology. VA's DHCP system was modified for use in DoD and DHCP, and VistA is used in modified form by the Indian Health Service. By the late-1990's, the three largest federal systems providing direct health care were using derivatives of VA's EHR, although only VA was using the current and more robust version including CPRS.

Under the Health**e**Vet-VistA program, VA will incrementally enhance and supplement the current functional capabilities of VistA and will provide increased flexibility, more sophisticated analytical tools, and support for seamless data sharing among providers

both within and outside VA. Like VistA, software developed under the Health***e***Vet program will be available in the public domain. Federal agencies, small medical practices, and EHR system vendors will all benefit from the advances made through Health***e***Vet-VistA.

Given the success of VistA, some people have asked why we are changing it. The short answer is "to benefit the veteran".

VA health IT systems have been forged and tested in the real world of health care. I can think of no other successful organization, with a history of innovation and a world-class system, that would simply rest on its laurels.

One reason there is so much interest in VistA is that it has never been a static system. The health care environment of today is not the health care environment of ten years ago. Nor is the VistA system today the VistA system of ten years ago – or even of one year ago. VA has continued to refine and enhance VistA since its introduction to reflect advances in clinical practice, the availability of new commercial products, the changing VA health care model, new Congressional mandates (such as those related to current combat engagements), and federal laws (such as the Health Insurance Portability and Accountability Act, the Federal Information Security Management Act, and the Privacy Act.

We have to make these types of changes all the time – that's the nature of health care. The current VistA system has served us well through decades of transformation in health care. But VA has outgrown its facility-centric architecture, and the system is simply becoming too expensive to maintain. Health***e***Vet-VistA will give us a more flexible architecture so that we can support integrated ambulatory care and home-base health care, maintain continuity of operations in the event of a disaster, and improve response time by increasing system capacity and communications speed.

Health***e***Vet-VistA will also allow us to strengthen privacy and security protections through use of features such as role-based access. We will be able to limit access to information based on the user's identity, location, job function, or legal authority, for example. We will strengthen our ability to track exactly who looks at the information, at what time, and for how long.

An estimated 40% of veterans we treat at VA each year also receive care from non-VA physicians. VA is working with DoD, ONCHIT, and other partner organizations to develop a longitudinal health record that will incorporate information from DoD, VA, and private-sector health providers from whom the veteran has sought care. Throughout these collaborative projects, safeguards have been implemented to ensure that the privacy of individuals is protected in accordance with the various confidentiality statutes and regulations governing health records, including the Privacy Act, the HIPAA Privacy Rule, and several agency-specific authorities. As we work toward greater data exchange and true interoperability with our health care partners, privacy and security of medical information will be a top priority.

*Personal Health Records and My Health**e**Vet*

I'd like to highlight another key component of the Health**e**Vet initiative: the My Health**e**Vet personal health record system, designed specifically to meet the needs of veterans.

Personal health records are an adjunct to the electronic health records used in a clinical setting, providing patients a secure means of maintaining copies of their medical records and other personal health information they deem important. Information in a personal health record is the property of the patient; it is the patient who controls what information is stored and what information is accessible by others. Personal health records enable patients to consolidate information from multiple providers without having to track down, compile, and carry around copies of paper records. By simplifying the collection and maintenance of health information, personal health records encourage patients to become more involved in the health care decisions that affect them.

The VHA My Health**e**Vet project was conceived as a way to help veterans manage their personal health data. My Health*e*Vet is a secure, web-based personal health record system designed to provide veterans key parts of their VHA health record as well as enabling them to enter, view, and update additional personal health information. Patients who take over-the-counter medications or herbs, or who monitor their own blood pressure, blood glucose, or weight, for example, can enter this information in their personal health records. They can enter readings such as cholesterol and pain, and can track results over time. My Health**e**Vet includes a direct link to the Medlineplus.gov library of information on medical conditions, medications, health news, and preventive health from the National Institutes of Health and other authoritative sources. Veterans can use the system to explore health topics, research diseases and conditions, learn about veteran-specific conditions, understand medication and treatment options, assess and improve their wellness, view seasonal health reminders, and more.

The implications of My Health**e**Vet are far-reaching. Clinicians will be able to communicate and collaborate with veterans much more easily. With My Health**e**Vet, veterans are able to consolidate and monitor their own health records and share this information with non-VA clinicians and others involved in their care. Patients who take a more active role in their health care have been found to have improved clinical outcomes and treatment adherence, as well as increased satisfaction with their care.

The first version of My Health**e**Vet was released on Veterans Day 2003, and more than 50,000 veterans are now registered to use the system. The My Health**e**Vet user community is growing, with over 300 new registrants joining each day. By the end of this summer, veterans who receive their health care at VA will be able to use My Health**e**Vet to refill prescriptions online. By this time next year, veterans receiving care at VA medical centers will be able to request and maintain copies of key portions of their health records electronically through My Health**e**Vet and to grant authority to view that

information to family members, veterans' service officers, and VA and non-VA clinicians involved in their care. This would allow a relative to provide support and care – even at a distance – by being better informed about the veteran's health and medical status. Subsequent releases will provide additional capabilities, enabling veterans to view upcoming appointments and see co-payment balances.

Summary

For decades, VA has developed innovative IT solutions to support health care for veterans. Over the past several years, VA has worked with federal, state, and industry partners to broaden the use of information technology in health care. We have continued to enhance the capabilities of the EHR while protecting the privacy of our veteran population and maintaining the integrity of our systems. These efforts have helped lay the groundwork for the President's health IT initiative.

The team of VHA developers, clinicians, and administrators who designed VistA changed the practice of medicine in VA by creating IT tools such as these to support the interaction between providers in VA and their patients, increase patient safety, and improve reporting and tracking of clinical and administrative data. VA is now involved with public- and private-sector partners in the development of a new national model for the use of IT in health care, featuring more sophisticated clinical decision support tools, increased data sharing among health care providers, and the availability of affordable EHR technology to providers large and small.

When he announced his plan to transform health care through the use of information technology, the President noted our country's long and distinguished history of innovation – as well as our failure to use health information technology consistently as an *integral* part of medical care in America.

We still have a long way to go in optimizing our use of information technology in health care; yet, we are not starting from scratch. Electronic health records, personal health records, data and communication standards, and sophisticated analytical tools – the building blocks of a comprehensive, national health information infrastructure – have already been implemented in some communities and settings and are maturing quickly. Our challenge is to create a technology infrastructure that will revolutionize health care without interfering with the human interaction between physicians and patients that is at the core of the art of medicine and without compromising the security and privacy of personal health information.

The President recognized America's medical professionals and the skill they have shown in providing high-quality health care despite our reliance on an outdated, paper-based system. At VA, we know that the support of clinicians is essential to the successful implementation of electronic health records and new IT tools. Clinicians, while often the greatest proponents of health information technology, can also be the greatest critics. At VA, physicians, nurses, and other providers are actively involved in defining requirements and business rules for systems, prioritizing enhancements, and

conducting end-user testing. This involvement improves system usability**,** increases user acceptance, minimizes disruption during upgrades, and most importantly, enables us to tailor systems to the needs of the health care community.

Throughout VA, the electronic health record is no longer a novelty – it is accepted as a standard tool in the provision of health care. For 20 years, VA has been an innovator in health care IT. We are now at the brink of a new era in health care, in which a new national model for the use of IT will support the development of more sophisticated clinical decision support tools, increased data sharing among health care providers, and the broader availability of affordable EHR technology to providers large and small. As VA refines and expands its use of information technology, we look forward to sharing our systems and expertise with our partners throughout the health care community to support the President's plan for transforming health care – and the health of our veterans.

Mr. Chairman, this completes my statement. I will now be happy to answer any questions that you or other members of the Subcommittee have.